SEQUENCE LISTING

<110> GEORGETOWN UNIVERSITY

<120> STRUCTURE OF MATRIPTASE, A NOVEL SERINE PROTEASE AND ITS APPLICATION IN DIAGNOSIS, PREVENTION AND THERAPY OF CANCER AND OTHER CONDITIONS

<130> 082137/0280655

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<151> 2000-05-08

<150> 60/124,006
<151> 1999-03-12

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<170> PatentIn Ver. 2.1

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Thr Gln Ala Gly Pro Pro Pro Ala Pro Pro Gly Leu Pro Ala Gly Ala
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Asp Cys Leu Asn Ser Phe Thr Ala Gly Val Pro Gly Phe Val Leu Asp
     50                  55                  60

Thr Asn Ala Ser Val Ser Asn Gly Ala Thr Phe Leu Glu Ser Pro Thr
 65                  70                  75                  80

Val Arg Arg Gly Trp Asp Cys Val Arg Ala Cys Cys Thr Thr Gln Asn
                 85                  90                  95

Cys Asn Leu Ala Leu Val Glu Leu Gln Pro Asp Arg Gly Glu Asp Ala
            100                 105                 110

Ile Ala Ala Cys Phe Leu Ile Asn Cys Leu Tyr Glu Gln Asn Phe Val
        115                 120                 125

Cys Lys Phe Ala Pro Arg Glu Gly Phe Ile Asn Tyr Leu Thr Arg Glu
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Val Tyr Arg Ser Tyr Arg Gln Leu Arg Thr Gln Gly Phe Gly Gly Ser
145                 150                 155                 160

Gly Ile Pro Lys Ala Trp Ala Gly Ile Asp Leu Lys Val Gln Pro Gln
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Arg Gly Asp Thr Asp Val Arg Val Glu Arg Lys Asp Pro Asn Gln Val
195 200 205

Glu Leu Trp Gly Leu Lys Glu Gly Thr Tyr Leu Phe Gln Leu Thr Val
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Thr Ser Ser Asp His Pro Glu Asp Thr Ala Asn Val Thr Val Thr Val
225 230 235 240

Leu Ser Thr Lys Gln Thr Glu Asp Tyr Cys Leu Ala Ser Asn Lys Val
245 250 255

Gly Arg Cys Arg Gly Ser Phe Pro Arg Trp Tyr Tyr Asp Pro Thr Glu
260 265 270

Gln Ile Cys Lys Ser Phe Val Tyr Gly Gly Cys Leu Gly Asn Lys Asn
275 280 285

Asn Tyr Leu Arg Glu Glu Glu Cys Ile Leu Ala Cys Arg Gly Val Gln
290 295 300

Gly Pro Ser Met Glu Arg Arg His Pro Val Cys Ser Gly Thr Cys Gln
305 310 315 320

Pro Thr Gln Phe Arg Cys Ser Asn Gly Cys Cys Ile Asp Ser Phe Leu
325 330 335

Glu Cys Asp Asp Thr Pro Asn Cys Pro Asp Ala Ser Asp Glu Ala Ala
340 345 350

Cys Glu Lys Tyr Thr Ser Gly Phe Asp Glu Leu Gln Arg Ile His Phe
355 360 365

Pro Ser Asp Lys Gly His Cys Val Asp Leu Pro Asp Thr Gly Leu Cys
370 375 380

Lys Glu Ser Ile Pro Arg Trp Tyr Tyr Asn Pro Phe Ser Glu His Cys
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Ala Arg Phe Thr Tyr Gly Gly Cys Tyr Gly Asn Lys Asn Asn Phe Glu
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Glu Glu Gln Gln Cys Leu Glu Ser Cys Arg Gly Ile Ser Lys Lys Asp
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Val Phe Gly Leu Arg Arg Glu Ile Pro Ile Pro Ser Asp Gly Ser Val
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Glu Met Ala Val Ala Val Phe Leu Val Ile Cys Ile Val Val Val Val
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Ala Ile Leu Gly Tyr Cys Phe Phe Lys Asn Gln Arg Lys Asp Phe His
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gtaagcctgg ccagcaaggt gaaggacgcg ctgaagctgc tgtacagcgg agtcccattc 240

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tactactggt ctgagttcag catcccgcag cacctggtgg aggaggccga gcgcgtc 357

atg gcc gag gag cgc gta gtc atg ctg ccc ccg cgg gcg cgc tcc ctg 405
Met Ala Glu Glu Arg Val Val Met Leu Pro Pro Arg Ala Arg Ser Leu
1 5 10 15

aag tcc ttt gtg gtc acc tca gtg gtg gct ttc ccc acg gac tcc aaa 453
Lys Ser Phe Val Val Thr Ser Val Val Ala Phe Pro Thr Asp Ser Lys
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aca gta cag agg acc cag gac aac agc tgc agc ttt ggc ctg cac gcc 501
Thr Val Gln Arg Thr Gln Asp Asn Ser Cys Ser Phe Gly Leu His Ala
35 40 45

cgc ggt gtg gag ctg atg cgc ttc acc acg ccc ggc ttc cct gac agc 549
Arg Gly Val Glu Leu Met Arg Phe Thr Thr Pro Gly Phe Pro Asp Ser
50 55 60

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ccc tac ccc gct cat gcc cgc tgc cag tgg gcc ctg cgg ggg gac gcc   597
Pro Tyr Pro Ala His Ala Arg Cys Gln Trp Ala Leu Arg Gly Asp Ala
 65                  70                  75                  80

gac tca gtg ctg agc ctc acc ttc cgc agc ttt gac ctt gcg tcc tgc   645
Asp Ser Val Leu Ser Leu Thr Phe Arg Ser Phe Asp Leu Ala Ser Cys
                85                  90                  95

gac gag cgc ggc agc gac ctg gtg acg gtg tac aac acc ctg agc ccc   693
Asp Glu Arg Gly Ser Asp Leu Val Thr Val Tyr Asn Thr Leu Ser Pro
            100                 105                 110

atg gag ccc cac gcc ctg gtg cag ttg tgt ggc acc tac cct ccc tcc   741
Met Glu Pro His Ala Leu Val Gln Leu Cys Gly Thr Tyr Pro Pro Ser
        115                 120                 125

tac aac ctg acc ttc cac tcc tcc cag aac gtc ctg ctc atc aca ctg   789
Tyr Asn Leu Thr Phe His Ser Ser Gln Asn Val Leu Leu Ile Thr Leu
    130                 135                 140

ata acc aac act gag cgg cgg cat ccc ggc ttt gag gcc acc ttc ttc   837
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145                 150                 155                 160

cag ctg cct agg atg agc agc tgt gga ggc cgc tta cgt aaa gcc cag   885
Gln Leu Pro Arg Met Ser Ser Cys Gly Gly Arg Leu Arg Lys Ala Gln
                165                 170                 175

ggg aca ttc aac agc ccc tac tac cca ggc cac tac cca ccc aac att   933
Gly Thr Phe Asn Ser Pro Tyr Tyr Pro Gly His Tyr Pro Pro Asn Ile
            180                 185                 190

gac tgc aca tgg aac att gag gtg ccc aac aac cag cat gtg aag gtg   981
Asp Cys Thr Trp Asn Ile Glu Val Pro Asn Asn Gln His Val Lys Val
        195                 200                 205

cgc ttc aaa ttc ttc tac ctg ctg gag ccc cgg cgt gcc tgc ggc acc   1029
Arg Phe Lys Phe Phe Tyr Leu Leu Glu Pro Arg Arg Ala Cys Gly Thr
    210                 215                 220

tgc ccc aag gac tac gtg gag atc aat ggg gag aaa tac tgc gga gag   1077
Cys Pro Lys Asp Tyr Val Glu Ile Asn Gly Glu Lys Tyr Cys Gly Glu
225                 230                 235                 240

agg tcc cag ttc gtc gtc acc agc aac agc aac aag atc aca gtt cgc   1125
Arg Ser Gln Phe Val Val Thr Ser Asn Ser Asn Lys Ile Thr Val Arg
                245                 250                 255

ttc cac tca gat cag tcc tac acc gac acc ggc ttc tta gct gaa tac   1173
Phe His Ser Asp Gln Ser Tyr Thr Asp Thr Gly Phe Leu Ala Glu Tyr
            260                 265                 270

ctc tcc tac gac tcc agt gac cca tgc ccg ggg cag ttc acg tgc cgc   1221
Leu Ser Tyr Asp Ser Ser Asp Pro Cys Pro Gly Gln Phe Thr Cys Arg
        275                 280                 285

acg ggg cgg tgt atc cgg aag gag ctg cgc tgt gat ggc tgg gcc gac   1269
Thr Gly Arg Cys Ile Arg Lys Glu Leu Arg Cys Asp Gly Trp Ala Asp
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tgc acc gac cac agc gat gag ctc aac tgc agt tgc gac gcc ggc cac   1317
Cys Thr Asp His Ser Asp Glu Leu Asn Cys Ser Cys Asp Ala Gly His
305                 310                 315                 320

cag ttc acg tgc aag aac aag ttc tgc aag ccc ctc ttc tgg gtc tgc   1365
Gln Phe Thr Cys Lys Asn Lys Phe Cys Lys Pro Leu Phe Trp Val Cys
                325                 330                 335

gac agt gtg aac gac tgc gga gac aac agc gac gag cag ggg tgc agt   1413
Asp Ser Val Asn Asp Cys Gly Asp Asn Ser Asp Glu Gln Gly Cys Ser
            340                 345                 350

tgt ccg gcc cag acc ttc agg tgt tcc aat ggg aag tgc ctc tcg aaa   1461
Cys Pro Ala Gln Thr Phe Arg Cys Ser Asn Gly Lys Cys Leu Ser Lys
        355                 360                 365

agc cag cag tgc aat ggg aag gac gac tgt ggg gac ggg tcc gac gag   1509
Ser Gln Gln Cys Asn Gly Lys Asp Asp Cys Gly Asp Gly Ser Asp Glu
    370                 375                 380

gcc tcc tgc ccc aag gtg aac gtc gtc act tgt acc aaa cac acc tac   1557
Ala Ser Cys Pro Lys Val Asn Val Val Thr Cys Thr Lys His Thr Tyr
385                 390                 395                 400

cgc tgc ctc aat ggg ctc tgc ttg agc aag ggc aac cct gag tgt gac   1605
Arg Cys Leu Asn Gly Leu Cys Leu Ser Lys Gly Asn Pro Glu Cys Asp
                405                 410                 415

ggg aag gag gac tgt agc gac ggc tca gat gag aag gac tgc gac tgt   1653
Gly Lys Glu Asp Cys Ser Asp Gly Ser Asp Glu Lys Asp Cys Asp Cys
            420                 425                 430

ggg ctg cgg tca ttc acg aga cag gct cgt gtt gtt ggg ggc acg gat   1701
Gly Leu Arg Ser Phe Thr Arg Gln Ala Arg Val Val Gly Gly Thr Asp
        435                 440                 445

gcg gat gag ggc gag tgg ccc tgg cag gta agc ctg cat gct ctg ggc   1749
Ala Asp Glu Gly Glu Trp Pro Trp Gln Val Ser Leu His Ala Leu Gly
    450                 455                 460

cag ggc cac atc tgc ggt gct tcc ctc atc tct ccc aac tgg ctg gtc   1797
Gln Gly His Ile Cys Gly Ala Ser Leu Ile Ser Pro Asn Trp Leu Val
465                 470                 475                 480

tct gcc gca cac tgc tac atc gat gac aga gga ttc agg tac tca gac   1845
Ser Ala Ala His Cys Tyr Ile Asp Asp Arg Gly Phe Arg Tyr Ser Asp
                485                 490                 495

ccc acg cag tgg acg gcc ttc ctg ggc ttg cac gac cag agc cag cgc   1893
Pro Thr Gln Trp Thr Ala Phe Leu Gly Leu His Asp Gln Ser Gln Arg
            500                 505                 510

agc gcc cct ggg gtg cag gag cgc agg ctc aag cgc atc atc tcc cac   1941
Ser Ala Pro Gly Val Gln Glu Arg Arg Leu Lys Arg Ile Ile Ser His
        515                 520                 525

ccc ttc ttc aat gac ttc acc ttc gac tat gac atc gcg ctg ctg gag   1989
Pro Phe Phe Asn Asp Phe Thr Phe Asp Tyr Asp Ile Ala Leu Leu Glu
    530                 535                 540
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ctg gag aaa ccg gca gag tac agc tcc atg gtg cgg ccc atc tgc ctg   2037
Leu Glu Lys Pro Ala Glu Tyr Ser Ser Met Val Arg Pro Ile Cys Leu
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ccg gac gcc tcc cat gtc ttc cct gcc ggc aag gcc atc tgg gtc acg   2085
Pro Asp Ala Ser His Val Phe Pro Ala Gly Lys Ala Ile Trp Val Thr
                565                 570                 575

ggc tgg gga cac acc cag tat gga ggc act ggc gcg ctg atc ctg caa   2133
Gly Trp Gly His Thr Gln Tyr Gly Gly Thr Gly Ala Leu Ile Leu Gln
            580                 585                 590

aag ggt gag atc cgc gtc atc aac cag acc acc tgc gag aac ctc ctg   2181
Lys Gly Glu Ile Arg Val Ile Asn Gln Thr Thr Cys Glu Asn Leu Leu
        595                 600                 605

ccg cag cag atc acg ccg cgc atg atg tgc gtg ggc ttc ctc agc ggc   2229
Pro Gln Gln Ile Thr Pro Arg Met Met Cys Val Gly Phe Leu Ser Gly
    610                 615                 620

ggc gtg gac tcc tgc cag ggt gat tcc ggg gga ccc ctg tcc agc gtg   2277
Gly Val Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Ser Ser Val
625                 630                 635                 640

gag gcg gat ggg cgg atc ttc cag gcc ggt gtg gtg agc tgg gga gac   2325
Glu Ala Asp Gly Arg Ile Phe Gln Ala Gly Val Val Ser Trp Gly Asp
                645                 650                 655

ggc tgc gct cag agg aac aag cca ggc gtg tac aca agg ctc cct ctg   2373
Gly Cys Ala Gln Arg Asn Lys Pro Gly Val Tyr Thr Arg Leu Pro Leu
            660                 665                 670

ttt cgg gac tgg atc aaa gag aac act ggg gta tag gggccggggc        2419
Phe Arg Asp Trp Ile Lys Glu Asn Thr Gly Val
        675                 680

cacccaaatg tgtacacctg cggggccacc catcgtccac cccagtgtgc acgcctgcag 2479

gctggagact ggaccgctga ctgcaccagc gcccccagaa catacactgt gaactcaatc 2539

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gacacagcct cccccgccag ccccaagctg ggccgaggcg cgtttgtgta tatctgcctc 2719

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ggaccctgga aaacagacgg gtctgagact gaaaatggtt taccagctcc caggtgactt 2899

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Thr Val Gln Arg Thr Gln Asp Asn Ser Cys Ser Phe Gly Leu His Ala
         35                  40                  45

Arg Gly Val Glu Leu Met Arg Phe Thr Thr Pro Gly Phe Pro Asp Ser
     50                  55                  60

Pro Tyr Pro Ala His Ala Arg Cys Gln Trp Ala Leu Arg Gly Asp Ala
 65                  70                  75                  80

Asp Ser Val Leu Ser Leu Thr Phe Arg Ser Phe Asp Leu Ala Ser Cys
                 85                  90                  95

Asp Glu Arg Gly Ser Asp Leu Val Thr Val Tyr Asn Thr Leu Ser Pro
            100                 105                 110

Met Glu Pro His Ala Leu Val Gln Leu Cys Gly Thr Tyr Pro Pro Ser
        115                 120                 125

Tyr Asn Leu Thr Phe His Ser Ser Gln Asn Val Leu Leu Ile Thr Leu
    130                 135                 140

Ile Thr Asn Thr Glu Arg Arg His Pro Gly Phe Glu Ala Thr Phe Phe
145                 150                 155                 160

Gln Leu Pro Arg Met Ser Ser Cys Gly Gly Arg Leu Arg Lys Ala Gln
                165                 170                 175

Gly Thr Phe Asn Ser Pro Tyr Tyr Pro Gly His Tyr Pro Pro Asn Ile
            180                 185                 190

Asp Cys Thr Trp Asn Ile Glu Val Pro Asn Asn Gln His Val Lys Val
        195                 200                 205

Arg Phe Lys Phe Phe Tyr Leu Leu Glu Pro Arg Arg Ala Cys Gly Thr
    210                 215                 220

Cys Pro Lys Asp Tyr Val Glu Ile Asn Gly Glu Lys Tyr Cys Gly Glu
225                 230                 235                 240

Arg Ser Gln Phe Val Val Thr Ser Asn Ser Asn Lys Ile Thr Val Arg
                245                 250                 255

Phe His Ser Asp Gln Ser Tyr Thr Asp Thr Gly Phe Leu Ala Glu Tyr
            260                 265                 270

Leu Ser Tyr Asp Ser Ser Asp Pro Cys Pro Gly Gln Phe Thr Cys Arg
        275                 280                 285

Thr Gly Arg Cys Ile Arg Lys Glu Leu Arg Cys Asp Gly Trp Ala Asp
    290                 295                 300

Cys Thr Asp His Ser Asp Glu Leu Asn Cys Ser Cys Asp Ala Gly His
305                 310                 315                 320
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Gln Phe Thr Cys Lys Asn Lys Phe Cys Lys Pro Leu Phe Trp Val Cys
325 330 335

Asp Ser Val Asn Asp Cys Gly Asp Asn Ser Asp Glu Gln Gly Cys Ser
340 345 350

Cys Pro Ala Gln Thr Phe Arg Cys Ser Asn Gly Lys Cys Leu Ser Lys
355 360 365

Ser Gln Gln Cys Asn Gly Lys Asp Asp Cys Gly Asp Gly Ser Asp Glu
370 375 380

Ala Ser Cys Pro Lys Val Asn Val Val Thr Cys Thr Lys His Thr Tyr
385 390 395 400

Arg Cys Leu Asn Gly Leu Cys Leu Ser Lys Gly Asn Pro Glu Cys Asp
405 410 415

Gly Lys Glu Asp Cys Ser Asp Gly Ser Asp Glu Lys Asp Cys Asp Cys
420 425 430

Gly Leu Arg Ser Phe Thr Arg Gln Ala Arg Val Val Gly Gly Thr Asp
435 440 445

Ala Asp Glu Gly Glu Trp Pro Trp Gln Val Ser Leu His Ala Leu Gly
450 455 460

Gln Gly His Ile Cys Gly Ala Ser Leu Ile Ser Pro Asn Trp Leu Val
465 470 475 480

Ser Ala Ala His Cys Tyr Ile Asp Asp Arg Gly Phe Arg Tyr Ser Asp
485 490 495

Pro Thr Gln Trp Thr Ala Phe Leu Gly Leu His Asp Gln Ser Gln Arg
500 505 510

Ser Ala Pro Gly Val Gln Glu Arg Arg Leu Lys Arg Ile Ile Ser His
515 520 525

Pro Phe Phe Asn Asp Phe Thr Phe Asp Tyr Asp Ile Ala Leu Leu Glu
530 535 540

Leu Glu Lys Pro Ala Glu Tyr Ser Ser Met Val Arg Pro Ile Cys Leu
545 550 555 560

Pro Asp Ala Ser His Val Phe Pro Ala Gly Lys Ala Ile Trp Val Thr
565 570 575

Gly Trp Gly His Thr Gln Tyr Gly Gly Thr Gly Ala Leu Ile Leu Gln
580 585 590

Lys Gly Glu Ile Arg Val Ile Asn Gln Thr Thr Cys Glu Asn Leu Leu
595 600 605

Pro Gln Gln Ile Thr Pro Arg Met Met Cys Val Gly Phe Leu Ser Gly
610 615 620

Gly Val Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Ser Ser Val
625 630 635 640

Glu Ala Asp Gly Arg Ile Phe Gln Ala Gly Val Val Ser Trp Gly Asp
645 650 655

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Phe Arg Asp Trp Ile Lys Glu Asn Thr Gly Val
        675                 680


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Leu Gly Gln Gly His Ile Cys Gly Ala Ser Leu Ile Ser Pro Asn Trp
         35                  40                  45

Leu Val Ser Ala Ala His Cys Tyr Ile Asp Asp Arg Gly Phe Arg Tyr
     50                  55                  60

Ser Asp Pro Thr Gln Trp Thr Ala Phe Leu Gly Leu His Asp Gln Ser
 65                  70                  75                  80

Gln Arg Ser Ala Pro Gly Val Gln Glu Arg Arg Leu Lys Arg Ile Ile
                 85                  90                  95

Ser His Pro Phe Phe Asn Asp Phe Thr Phe Asp Tyr Asp Ile Ala Leu
            100                 105                 110

Leu Glu Leu Glu Lys Pro Ala Glu Tyr Ser Ser Met Val Arg Pro Ile
        115                 120                 125

Cys Leu Pro Asp Ala Ser His Val Phe Pro Ala Gly Lys Ala Ile Trp
    130                 135                 140

Val Thr Gly Trp Gly His Thr Gln Tyr Gly Gly Thr Gly Ala Leu Ile
145                 150                 155                 160

Leu Gln Lys Gly Glu Ile Arg Val Ile Asn Gln Thr Thr Cys Glu Asn
                165                 170                 175

Leu Leu Pro Gln Gln Ile Thr Pro Arg Met Met Cys Val Gly Phe Leu
            180                 185                 190

Ser Gly Gly Val Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Ser
        195                 200                 205

Ser Val Glu Ala Asp Gly Arg Ile Phe Gln Ala Gly Val Val Ser Trp
    210                 215                 220

Gly Asp Gly Cys Ala Gln Arg Asn Lys Pro Gly Val Tyr Thr Arg Leu
225                 230                 235                 240

Pro Leu Phe Arg Asp Trp Ile Lys Glu Asn Thr Gly Val
                245                 250
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Tyr Tyr Gly Gly Arg Leu Leu Cys Gly Ala Ser Leu Val Ser Ser Asp
35 40 45

Trp Leu Val Ser Ala Ala His Cys Tyr Tyr Gly Arg Asn Leu Glu Pro
50 55 60

Ser Lys Trp Thr Ala Ile Leu Gly Leu His Met Lys Ser Asn Leu Thr
65 70 75 80

Ser Pro Gln Thr Val Pro Arg Leu Ile Asp Glu Ile Val Ile Asn Pro
85 90 95

His Tyr Asn Arg Arg Arg Lys Asp Asn Asp Ile Ala Met Met His Leu
100 105 110

Glu Phe Lys Val Asn Tyr Thr Asp Tyr Ile Gln Pro Ile Cys Leu Pro
115 120 125

Glu Glu Asn Gln Val Phe Pro Pro Gly Arg Asn Cys Ser Ile Ala Gly
130 135 140

Trp Gly Thr Val Val Tyr Gln Gly Thr Thr Ala Asn Ile Leu Gln Glu
145 150 155 160

Ala Asp Val Pro Leu Leu Ser Asn Glu Arg Cys Gln Gln Gln Met Pro
165 170 175

Glu Tyr Asn Ile Thr Glu Asn Met Ile Cys Ala Gly Tyr Glu Glu Gly
180 185 190

Gly Ile Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Met Cys Gln
195 200 205

Glu Asn Asn Arg Trp Phe Leu Ala Gly Val Thr Ser Phe Gly Tyr Lys
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Cys Ala Leu Pro Asn Arg Pro Gly Val Tyr Ala Arg Val Ser Arg Phe
225 230 235 240

Thr Glu Trp Ile Gln Ser Phe Leu His
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Gly Glu Ser Ala Leu Pro Gly Ala Trp Pro Trp Gln Val Ser Leu His
             20                  25                  30

Val Gln Asn Val His Val Cys Gly Gly Ser Ile Ile Thr Pro Glu Trp
         35                  40                  45

Ile Val Thr Ala Ala His Cys Val Glu Lys Pro Leu Asn Asn Pro Trp
     50                  55                  60

His Trp Thr Ala Phe Ala Gly Ile Leu Arg Gln Ser Phe Met Phe Tyr
 65                  70                  75                  80

Gly Ala Gly Tyr Gln Val Gln Lys Val Ile Ser His Pro Asn Tyr Asp
                 85                  90                  95

Ser Lys Thr Lys Asn Asn Asp Ile Ala Leu Met Lys Leu Gln Lys Pro
            100                 105                 110

Leu Thr Phe Asn Asp Leu Val Lys Pro Val Cys Leu Pro Asn Pro Gly
        115                 120                 125

Met Met Leu Gln Pro Glu Gln Leu Cys Trp Ile Ser Gly Trp Gly Ala
    130                 135                 140

Thr Glu Glu Lys Gly Lys Thr Ser Glu Val Leu Asn Ala Ala Lys Val
145                 150                 155                 160

Leu Leu Ile Glu Thr Gln Arg Cys Asn Ser Arg Tyr Val Tyr Asp Asn
                165                 170                 175

Leu Ile Thr Pro Ala Met Ile Cys Ala Gly Phe Leu Gln Gly Asn Val
            180                 185                 190

Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Val Thr Ser Asn Asn
        195                 200                 205

Asn Ile Trp Trp Leu Ile Gly Asp Thr Ser Trp Gly Ser Gly Cys Ala
    210                 215                 220

Lys Ala Tyr Arg Pro Gly Val Tyr Gly Asn Val Met Val Phe Thr Asp
225                 230                 235                 240

Trp Ile Tyr Arg Gln Met Lys Ala Asn Gly
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Glu Cys Gly Val Pro Thr Leu Ala Arg Pro Glu Thr Arg Ile Val Gly
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             20                  25                  30
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Arg Thr Ser Phe Phe Gly Phe Ser Ser Thr His Arg Cys Gly Gly Ala
          35                  40                  45

Leu Ile Asn Glu Asn Trp Ile Ala Thr Ala Gly His Cys Val Asp Asp
      50                  55                  60

Leu Leu Ile Ser Gln Ile Arg Ile Arg Val Gly Glu Tyr Asp Phe Ser
 65                  70                  75                  80

His Val Gln Glu Gln Leu Pro Tyr Ile Glu Arg Gly Val Ala Lys Lys
                 85                  90                  95

Val Val His Pro Lys Tyr Ser Phe Leu Thr Tyr Glu Tyr Asp Leu Ala
            100                 105                 110

Leu Val Lys Leu Glu Gln Pro Leu Glu Phe Ala Pro His Val Ser Pro
        115                 120                 125

Ile Cys Leu Pro Glu Thr Asp Ser Leu Leu Ile Gly Met Asn Ala Thr
    130                 135                 140

Val Thr Gly Trp Gly Arg Leu Ser Glu Gly Gly Thr Leu Pro Ser Val
145                 150                 155                 160

Leu Gln Glu Val Ser Val Pro Ile Val Ser Asn Asp Asn Cys Lys Ser
                165                 170                 175

Met Phe Met Arg Ala Gly Arg Gln Glu Phe Ile Pro Asp Ile Phe Leu
            180                 185                 190

Cys Ala Gly Tyr Glu Thr Gly Gly Gln Asp Ser Cys Gln Gly Asp Ser
        195                 200                 205

Gly Gly Pro Leu Gln Ala Lys Ser Gln Asp Gly Arg Phe Phe Leu Ala
    210                 215                 220

Gly Ile Ile Ser Trp Gly Ile Gly Cys Ala Glu Ala Asn Leu Pro Gly
225                 230                 235                 240

Val Cys Thr Arg Ile Ser Lys Phe Thr Pro Trp Ile Leu Glu His Val
                245                 250                 255

Arg
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Asp Thr Ser Leu Gly Arg Trp Pro Trp Gln Val Ser Leu Arg Tyr Asp
             20                  25                  30

Gly Ala His Leu Cys Gly Gly Ser Leu Leu Ser Gly Asp Trp Val Leu
         35                  40                  45

Thr Ala Ala His Cys Phe Pro Glu Arg Asn Arg Val Leu Ser Arg Trp
     50                  55                  60
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Arg Val Phe Ala Gly Ala Val Ala Gln Ala Ser Pro His Gly Leu Gln
 65                  70                  75                  80

Leu Gly Val Gln Ala Val Val Tyr His Gly Gly Tyr Leu Pro Phe Arg
                 85                  90                  95

Asp Pro Asn Ser Glu Glu Asn Ser Asn Asp Ile Ala Leu Val His Leu
            100                 105                 110

Ser Ser Pro Leu Pro Leu Thr Glu Tyr Ile Gln Pro Val Cys Leu Pro
        115                 120                 125

Ala Ala Gly Gln Ala Leu Val Asp Gly Lys Ile Cys Thr Val Thr Gly
    130                 135                 140

Trp Gly Asn Thr Gln Tyr Tyr Gly Gln Gln Ala Gly Val Leu Gln Glu
145                 150                 155                 160

Ala Arg Val Pro Ile Ile Ser Asn Asp Val Cys Asn Gly Ala Asp Phe
                165                 170                 175

Tyr Gly Asn Gln Ile Lys Pro Lys Met Phe Cys Ala Gly Tyr Pro Glu
            180                 185                 190

Gly Gly Ile Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro Phe Val Cys
        195                 200                 205

Glu Asp Ser Ile Ser Arg Thr Pro Arg Trp Arg Leu Cys Gly Ile Val
    210                 215                 220

Ser Trp Gly Thr Gly Cys Ala Leu Ala Gln Lys Pro Gly Val Tyr Thr
225                 230                 235                 240

Lys Val Ser Asp Phe Arg Glu Trp Ile Phe Gln Ala Ile Lys Thr His
                245                 250                 255

Ser Glu Ala
```

<210> 11
<211> 247
<212> PRT
<213> Homo sapiens

```
<400> 11
Glu Cys Thr Thr Lys Ile Lys Pro Arg Ile Val Gly Gly Thr Ala Ser
  1               5                  10                  15

Val Arg Gly Glu Trp Pro Trp Gln Val Thr Leu His Thr Thr Ser Pro
             20                  25                  30

Thr Gln Arg His Leu Cys Gly Gly Ser Ile Ile Gly Asn Gln Trp Ile
         35                  40                  45

Leu Thr Ala Ala His Cys Phe Tyr Gly Val Glu Ser Pro Lys Ile Leu
     50                  55                  60

Arg Val Tyr Ser Gly Ile Leu Asn Gln Ser Glu Ile Lys Glu Asp Thr
 65                  70                  75                  80
```

```
Ser Phe Phe Gly Val Gln Glu Ile Ile Ile His Asp Gln Tyr Lys Met
                 85                  90                  95

Ala Glu Ser Gly Tyr Asp Ile Ala Leu Leu Lys Leu Glu Thr Thr Val
            100                 105                 110

Asn Tyr Thr Asp Ser Gln Arg Pro Ile Cys Leu Pro Ser Lys Gly Asp
        115                 120                 125

Arg Asn Val Ile Tyr Thr Asp Cys Trp Val Thr Gly Trp Gly Tyr Arg
    130                 135                 140

Lys Leu Arg Asp Lys Ile Gln Asp Thr Leu Gln Lys Ala Lys Ile Pro
145                 150                 155                 160

Leu Val Thr Asn Glu Glu Cys Gln Lys Arg Tyr Arg Gly His Lys Ile
                165                 170                 175

Thr His Lys Met Ile Cys Ala Gly Tyr Arg Glu Gly Gly Lys Asp Ala
            180                 185                 190

Cys Lys Gly Asp Ser Gly Gly Pro Leu Ser Cys Lys His Asn Glu Val
        195                 200                 205

Trp His Leu Val Gly Ile Thr Ser Trp Gly Glu Gly Cys Ala Gln Arg
    210                 215                 220

Glu Arg Pro Gly Val Tyr Thr Asn Val Val Glu Tyr Val Asp Trp Ile
225                 230                 235                 240

Leu Glu Lys Thr Gln Ala Val
                245
```

<210> 12
<211> 244
<212> PRT
<213> Homo sapiens

<400> 12

```
Asp Cys Gly Lys Pro Gln Val Glu Pro Lys Lys Cys Pro Gly Arg Val
  1               5                  10                  15

Val Gly Gly Cys Val Ala His Pro His Ser Trp Pro Trp Gln Val Ser
             20                  25                  30

Leu Arg Thr Arg Phe Gly Met His Phe Cys Gly Gly Thr Leu Ile Ser
         35                  40                  45

Pro Glu Trp Val Leu Thr Ala Ala His Cys Leu Glu Lys Ser Pro Arg
     50                  55                  60

Pro Ser Ser Tyr Lys Val Ile Leu Gly Ala His Gln Glu Val Asn Leu
 65                  70                  75                  80

Glu Pro His Val Gln Glu Ile Glu Val Ser Arg Leu Phe Leu Glu Pro
                 85                  90                  95

Thr Arg Lys Asp Ile Ala Leu Leu Lys Leu Ser Ser Pro Ala Val Ile
            100                 105                 110
```

```
Thr Asp Lys Val Ile Pro Ala Cys Leu Pro Ser Pro Asn Tyr Val Val
        115                 120                 125

Ala Asp Arg Thr Glu Cys Phe Ile Thr Gly Trp Gly Glu Thr Gln Gly
    130                 135                 140

Thr Phe Gly Ala Gly Leu Leu Glu Ala Gln Leu Pro Val Ile Glu Asn
145                 150                 155                 160

Lys Val Cys Asn Arg Tyr Glu Phe Leu Asn Gly Arg Val Gln Ser Thr
                165                 170                 175

Glu Leu Cys Ala Gly His Leu Ala Gly Gly Thr Asp Ser Cys Gln Gly
            180                 185                 190

Asp Ser Gly Gly Pro Leu Val Cys Phe Glu Lys Asp Lys Tyr Ile Leu
        195                 200                 205

Gln Gly Val Thr Ser Trp Gly Leu Gly Cys Ala Arg Pro Asn Lys Pro
    210                 215                 220

Gly Val Tyr Val Arg Val Ser Arg Phe Val Thr Trp Ile Glu Gly Val
225                 230                 235                 240

Met Arg Asn Asn
```

<210> 13
<211> 234
<212> PRT
<213> Homo sapiens

<400> 13

```
Val Ala Ala Pro Phe Asp Asp Asp Asp Lys Ile Val Gly Gly Tyr Ile
  1               5                  10                  15

Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu Asn Ser Gly Tyr
            20                  25                  30

His Phe Cys Gly Gly Ser Leu Ile Ser Glu Gln Trp Val Val Ser Ala
        35                  40                  45

Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu Gly Glu His Asn
    50                  55                  60

Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn Ala Ala Lys Ile
65                  70                  75                  80

Ile Arg His Pro Lys Tyr Asn Ser Arg Thr Leu Asp Asn Asp Ile Leu
                85                  90                  95

Leu Ile Lys Leu Ser Ser Pro Ala Val Ile Asn Ser Arg Val Ser Ala
            100                 105                 110

Ile Ser Leu Pro Thr Ala Pro Pro Ala Ala Gly Thr Glu Ser Leu Ile
        115                 120                 125

Ser Gly Trp Gly Asn Thr Leu Ser Ser Gly Ala Asp Tyr Pro Asp Glu
    130                 135                 140

Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala Glu Cys Glu Ala
145                 150                 155                 160
```

```
Ser Tyr Pro Gly Lys Ile Thr Asn Asn Met Phe Cys Val Gly Phe Leu
                165                 170                 175

Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Val Val
            180                 185                 190

Ser Asn Gly Glu Leu Gln Gly Ile Val Ser Trp Gly Tyr Gly Cys Ala
        195                 200                 205

Gln Lys Asn Arg Pro Gly Val Tyr Thr Lys Val Tyr Asn Tyr Val Asp
    210                 215                 220

Trp Ile Lys Asp Thr Ile Ala Ala Asn Ser
225                 230
```

<210> 14
<211> 240
<212> PRT
<213> Homo sapiens

<400> 14

```
Ile His Pro Val Leu Ser Gly Leu Ser Arg Ile Val Asn Gly Glu Asp
  1               5                  10                  15

Ala Val Pro Gly Ser Trp Pro Trp Gln Val Ser Leu Gln Asp Lys Thr
             20                  25                  30

Gly Phe His Phe Cys Gly Gly Ser Leu Ile Ser Glu Asp Trp Val Val
         35                  40                  45

Thr Ala Ala His Cys Gly Val Arg Thr Ser Asp Val Val Val Ala Gly
     50                  55                  60

Glu Phe Asp Gln Gly Ser Asp Glu Glu Asn Ile Gln Val Leu Lys Ile
 65                  70                  75                  80

Ala Lys Val Phe Lys Asn Pro Lys Phe Ser Ile Leu Thr Val Asn Asn
                 85                  90                  95

Asp Ile Thr Leu Leu Lys Leu Ala Thr Pro Ala Arg Phe Ser Gln Thr
            100                 105                 110

Val Ser Ala Val Cys Leu Pro Ser Ala Asp Asp Asp Phe Pro Ala Gly
        115                 120                 125

Thr Leu Cys Ala Thr Thr Gly Trp Gly Lys Thr Lys Tyr Asn Ala Asn
    130                 135                 140

Lys Thr Pro Asp Lys Leu Gln Gln Ala Ala Leu Pro Leu Leu Ser Asn
145                 150                 155                 160

Ala Glu Cys Lys Lys Ser Trp Gly Arg Arg Ile Thr Asp Val Asn Ile
                165                 170                 175

Cys Ala Gly Ala Ser Gly Val Ser Ser Cys Met Gly Asp Ser Gly Gly
            180                 185                 190

Pro Leu Val Cys Gln Lys Asp Gly Ala Trp Thr Leu Val Gly Ile Val
        195                 200                 205
```

```
Ser Trp Gly Ser Asp Thr Cys Ser Thr Ser Ser Pro Gly Val Tyr Ala
    210                 215                 220

Arg Val Thr Lys Leu Ile Pro Trp Val Gln Lys Ile Leu Ala Ala Asn
225                 230                 235                 240


<210> 15
<211> 145
<212> PRT
<213> Homo sapiens

<400> 15
Pro Cys Pro Gly Gln Phe Thr Cys Arg Thr Gly Arg Cys Ile Arg Lys
  1               5                  10                  15

Glu Leu Arg Cys Asp Gly Trp Ala Asp Cys Thr Asp His Ser Asp Glu
             20                  25                  30

Leu Asn Cys Ser Cys Asp Ala Gly His Gln Phe Thr Cys Lys Asn Lys
         35                  40                  45

Phe Cys Lys Pro Leu Phe Trp Val Cys Asp Ser Val Asn Asp Cys Gly
     50                  55                  60

Asp Asn Ser Asp Glu Gln Gly Ser Ser Cys Pro Ala Gln Thr Phe Arg
 65                  70                  75                  80

Cys Ser Asn Gly Lys Cys Leu Ser Lys Ser Gln Gln Cys Asn Gly Lys
                 85                  90                  95

Asp Asp Cys Gly Asp Gly Ser Asp Glu Ala Ser Cys Thr Cys Thr Lys
            100                 105                 110

His Thr Tyr Arg Cys Leu Asn Gly Leu Cys Leu Ser Lys Gly Asn Pro
        115                 120                 125

Glu Cys Asp Gly Lys Glu Asp Cys Ser Asp Gly Ser Asp Glu Lys Asp
    130                 135                 140

Cys
145


<210> 16
<211> 19
<212> PRT
<213> Homo sapiens

<400> 16
Thr Cys Glu Phe Cys Gly Cys Ile Trp Cys Asp Asp Cys Asp Gly Ser
  1               5                  10                  15

Asp Glu Cys


<210> 17
<211> 18
<212> PRT
<213> Homo sapiens

<400> 17
```

Cys Phe Cys Arg Cys Ile Pro Trp Cys Asp Gly Asp Cys Asp Ser Asp
1 5 10 15

Glu Cys

<210> 18
<211> 16
<212> PRT
<213> Homo sapiens

<400> 18
Pro Cys Pro Glu Phe Cys Cys Cys Asp Asp Cys Asp Ser Asp Glu Cys
1 5 10 15

<210> 19
<211> 16
<212> PRT
<213> Homo sapiens

<400> 19
Cys Phe Cys Cys Ile Cys Asp Gly Asp Cys Asp Gly Ser Asp Glu Cys
1 5 10 15

<210> 20
<211> 114
<212> PRT
<213> Homo sapiens

<400> 20
Cys Ser Phe Gly Leu His Ala Arg Gly Val Glu Leu Met Arg Phe Thr
1 5 10 15

Thr Pro Gly Phe Pro Asp Ser Pro Tyr Pro Ala His Ala Arg Cys Gln
20 25 30

Trp Ala Leu Arg Gly Asp Ala Asp Ser Val Leu Ser Leu Thr Phe Arg
35 40 45

Ser Phe Asp Leu Ala Ser Cys Asp Glu Arg Gly Ser Asp Leu Val Thr
50 55 60

Val Tyr Asn Thr Leu Ser Pro Met Glu Pro His Ala Leu Val Gln Leu
65 70 75 80

Cys Gly Thr Tyr Pro Pro Ser Tyr Asn Leu Thr Phe His Ser Ser Gln
85 90 95

Asn Val Leu Leu Ile Thr Leu Ile Thr Asn Thr Glu Arg Arg His Pro
100 105 110

Gly Phe

<210> 21
<211> 101
<212> PRT
<213> Homo sapiens

<400> 21

```
Cys Gly Gly Arg Leu Arg Lys Ala Gln Gly Thr Phe Asn Ser Pro Tyr
  1               5                  10                  15

Tyr Pro Gly His Tyr Pro Pro Asn Ile Asp Cys Thr Trp Asn Ile Glu
             20                  25                  30

Val Pro Asn Asn Gln His Val Lys Val Arg Phe Lys Phe Phe Tyr Leu
         35                  40                  45

Leu Glu Pro Gly Val Pro Ala Gly Thr Cys Pro Lys Asp Tyr Val Glu
     50                  55                  60

Ile Asn Gly Glu Lys Tyr Cys Gly Glu Arg Ser Gln Phe Val Val Thr
 65                  70                  75                  80

Ser Asn Ser Asn Lys Ile Thr Val Arg Phe His Ser Asp Gln Ser Tyr
                 85                  90                  95

Thr Asp Thr Gly Phe
             100
```

<210> 22
<211> 106
<212> PRT
<213> Homo sapiens

<400> 22

```
Cys Ser Ser Glu Leu Tyr Thr Glu Ala Ser Gly Tyr Ile Ser Ser Leu
  1               5                  10                  15

Glu Tyr Pro Arg Ser Tyr Pro Pro Asp Leu Arg Cys Asn Tyr Ser Ile
             20                  25                  30

Arg Val Glu Arg Gly Leu Thr Leu His Leu Lys Phe Leu Glu Pro Phe
         35                  40                  45

Asp Ile Asp Asp His Gln Gln Val His Cys Pro Tyr Asp Gln Leu Gln
     50                  55                  60

Ile Tyr Ala Asn Gly Lys Asn Ile Gly Glu Phe Cys Gly Lys Gln Arg
 65                  70                  75                  80

Pro Pro Asp Leu Asp Thr Ser Ser Asn Ala Val Asp Leu Leu Phe Phe
                 85                  90                  95

Thr Asp Glu Ser Gly Asp Ser Arg Gly Trp
             100                 105
```

<210> 23
<211> 109
<212> PRT
<213> Homo sapiens

<400> 23

```
Cys Ser Gly Asp Val Phe Thr Ala Leu Ile Gly Glu Ile Ala Ser Pro
  1               5                  10                  15

Asn Tyr Pro Lys Pro Tyr Pro Glu Asn Ser Arg Cys Glu Tyr Gln Ile
             20                  25                  30
```

```
Arg Leu Glu Lys Gly Phe Gln Val Val Val Thr Leu Arg Arg Glu Asp
          35                  40                  45

Phe Asp Val Glu Ala Ala Asp Ser Ala Gly Asn Cys Leu Asp Ser Leu
      50                  55                  60

Val Phe Val Ala Gly Asp Arg Gln Phe Gly Pro Tyr Cys Gly His Gly
 65                  70                  75                  80

Phe Pro Gly Pro Leu Asn Ile Glu Thr Lys Ser Asn Ala Leu Asp Ile
                 85                  90                  95

Ile Phe Gln Thr Asp Leu Thr Gly Gln Lys Lys Gly Trp
             100                 105
```

<210> 24
<211> 106
<212> PRT
<213> Homo sapiens

<400> 24

```
Cys Ser Asp Asn Leu Phe Thr Gln Arg Thr Gly Val Ile Thr Ser Pro
  1               5                  10                  15

Asp Phe Pro Asn Pro Tyr Pro Lys Ser Ser Glu Cys Leu Tyr Thr Ile
             20                  25                  30

Glu Leu Glu Glu Gly Phe Met Val Asn Leu Gln Phe Glu Asp Ile Phe
          35                  40                  45

Asp Ile Glu Asp His Pro Glu Val Pro Cys Pro Tyr Asp Tyr Ile Lys
      50                  55                  60

Ile Lys Val Gly Pro Lys Val Leu Gly Pro Phe Cys Gly Glu Lys Ala
 65                  70                  75                  80

Pro Glu Pro Ile Ser Thr Gln Ser His Ser Val Leu Ile Leu Phe His
                 85                  90                  95

Ser Asp Asn Ser Gly Glu Asn Arg Gly Trp
             100                 105
```

<210> 25
<211> 109
<212> PRT
<213> Homo sapiens

<400> 25

```
Cys Ser Gly Asp Val Phe Thr Ala Leu Ile Gly Glu Ile Ala Ser Pro
  1               5                  10                  15

Asn Tyr Pro Lys Pro Tyr Pro Glu Asn Ser Arg Cys Glu Tyr Gln Ile
             20                  25                  30

Arg Leu Glu Lys Gly Phe Gln Val Val Val Thr Leu Arg Arg Glu Asp
          35                  40                  45

Phe Asp Val Glu Ala Ala Asp Ser Ala Gly Asn Cys Gln Asp Ser Leu
      50                  55                  60
```

Leu Phe Ala Ala Lys Asn Arg Gln Phe Gly Pro Phe Cys Gly Asn Gly
65 70 75 80

Phe Pro Gly Pro Leu Thr Ile Glu Thr His Ser Asn Thr Leu Asp Ile
85 90 95

Val Phe Gln Thr Asp Leu Thr Glu Gln Lys Lys Gly Trp
100 105

<210> 26
<211> 3149
<212> DNA
<213> Homo sapiens

<400> 26
gacgcctgtg agacccgcga gcggcctcgg ggaccatggg gagcgatcgg gcccgcaagg 60
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tgaatggctt ggaggaaggc gtggagttcc tgccagtcaa caacgtcaag aaggtggaaa 180
agcatggccc ggggcgctgg gtggtgctgg cagccgtgct gatcggcctc ctcttggtct 240
tgctggggat cggcttcctg gtgtggcatt tgcagtaccg ggacgtgcgt gtccagaagg 300
tcttcaatgg ctacatgagg atcacaaatg agaattttgt ggatgcctac gagaactcca 360
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gcggagtccc attcctgggc ccctaccaca aggagtcggc tgtgacggcc ttcagcgagg 480
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acagtgtgaa cgactgcgga gacaacagcg acgagcaggg gtgcagttgt ccggcccaga 1620
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gctggggaca cacccagtat ggaggcactg gcgcgctgat cctgcaaaag ggtgagatcc 2340
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aacattttat ttctttttaa aaaaaaaaa                                   3149
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<210> 27
<211> 855
<212> PRT
<213> Homo sapiens

<400> 27

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Met Gly Ser Asp Arg Ala Arg Lys Gly Gly Gly Gly Pro Lys Asp Phe
  1               5                  10                  15

Gly Ala Gly Leu Lys Tyr Asn Ser Arg His Glu Lys Val Asn Gly Leu
             20                  25                  30

Glu Glu Gly Val Glu Phe Leu Pro Val Asn Asn Val Lys Lys Val Glu
         35                  40                  45

Lys His Gly Pro Gly Arg Trp Val Val Leu Ala Ala Val Leu Ile Gly
     50                  55                  60

Leu Leu Leu Val Leu Leu Gly Ile Gly Phe Leu Val Trp His Leu Gln
 65                  70                  75                  80

Tyr Arg Asp Val Arg Val Gln Lys Val Lys Asn Gly Tyr Met Arg Ile
                 85                  90                  95

Thr Asn Glu Asn Phe Val Asp Ala Tyr Glu Asn Ser Asn Ser Thr Glu
            100                 105                 110

Phe Val Ser Leu Ala Ser Lys Val Lys Asp Ala Leu Lys Leu Leu Tyr
        115                 120                 125

Ser Gly Val Pro Phe Leu Gly Pro Tyr His Lys Glu Ser Ala Val Thr
    130                 135                 140

Ala Phe Ser Glu Gly Ser Val Ile Ala Tyr Tyr Trp Ser Glu Phe Ser
145                 150                 155                 160

Ile Pro Gln His Leu Val Glu Glu Ala Glu Arg Val Met Ala Glu Glu
                165                 170                 175

Arg Val Val Met Leu Pro Pro Arg Ala Arg Ser Leu Lys Ser Phe Val
            180                 185                 190

Val Thr Ser Val Val Ala Phe Pro Thr Asp Ser Lys Thr Val Gln Arg
        195                 200                 205

Thr Gln Asp Asn Ser Cys Ser Phe Gly Leu His Ala Arg Gly Val Glu
    210                 215                 220

Leu Met Arg Phe Thr Thr Pro Gly Phe Pro Asp Ser Pro Tyr Pro Ala
225                 230                 235                 240

His Ala Arg Cys Gln Trp Ala Leu Arg Gly Asp Ala Asp Ser Val Leu
                245                 250                 255
```

Ser Leu Thr Phe Arg Ser Phe Asp Leu Ala Ser Cys Asp Glu Arg Gly
260 265 270

Ser Asp Leu Val Thr Val Tyr Asn Thr Leu Ser Pro Met Glu Pro His
275 280 285

Ala Leu Val Gln Leu Cys Gly Thr Tyr Pro Pro Ser Tyr Asn Leu Thr
290 295 300

Phe His Ser Ser Gln Asn Val Leu Leu Ile Thr Leu Ile Thr Asn Thr
305 310 315 320

Glu Arg Arg His Pro Gly Phe Glu Ala Thr Phe Phe Gln Leu Pro Arg
325 330 335

Met Ser Ser Cys Gly Gly Arg Leu Arg Lys Ala Gln Gly Thr Phe Asn
340 345 350

Ser Pro Tyr Tyr Pro Gly His Tyr Pro Pro Asn Ile Asp Cys Thr Trp
355 360 365

Asn Ile Glu Val Pro Asn Asn Gln His Val Lys Val Arg Phe Lys Phe
370 375 380

Phe Tyr Leu Leu Glu Pro Gly Val Pro Ala Gly Thr Cys Pro Lys Asp
385 390 395 400

Tyr Val Glu Ile Asn Gly Glu Lys Tyr Cys Gly Glu Arg Ser Gln Phe
405 410 415

Val Val Thr Ser Asn Ser Asn Lys Ile Thr Val Arg Phe His Ser Asp
420 425 430

Gln Ser Tyr Thr Asp Thr Gly Phe Leu Ala Glu Tyr Leu Ser Tyr Asp
435 440 445

Ser Ser Asp Pro Cys Pro Gly Gln Phe Thr Cys Arg Thr Gly Arg Cys
450 455 460

Ile Arg Lys Glu Leu Arg Cys Asp Gly Trp Ala Asp Cys Thr Asp His
465 470 475 480

Ser Asp Glu Leu Asn Cys Ser Cys Asp Ala Gly His Gln Phe Thr Cys
485 490 495

Lys Asn Lys Phe Cys Lys Pro Leu Phe Trp Val Cys Asp Ser Val Asn
500 505 510

Asp Cys Gly Asp Asn Ser Asp Glu Gln Gly Cys Ser Cys Pro Ala Gln
515 520 525

Thr Phe Arg Cys Ser Asn Gly Lys Cys Leu Ser Lys Ser Gln Gln Cys
530 535 540

Asn Gly Lys Asp Asp Cys Gly Asp Gly Ser Asp Glu Ala Ser Cys Pro
545 550 555 560

Lys Val Asn Val Val Thr Cys Thr Lys His Thr Tyr Arg Cys Leu Asn
565 570 575

```
Gly Leu Cys Leu Ser Lys Gly Asn Pro Glu Cys Asp Gly Lys Glu Asp
            580                 585                 590

Cys Ser Asp Gly Ser Asp Glu Lys Asp Cys Asp Cys Gly Leu Arg Ser
        595                 600                 605

Phe Thr Arg Gln Ala Arg Val Val Gly Gly Thr Asp Ala Asp Glu Gly
    610                 615                 620

Glu Trp Pro Trp Gln Val Ser Leu His Ala Leu Gly Gln Gly His Ile
625                 630                 635                 640

Cys Gly Ala Ser Leu Ile Ser Pro Asn Trp Leu Val Ser Ala Ala His
                645                 650                 655

Cys Tyr Ile Asp Asp Arg Gly Phe Arg Tyr Ser Asp Pro Thr Gln Trp
            660                 665                 670

Thr Ala Phe Leu Gly Leu His Asp Gln Ser Gln Arg Ser Ala Pro Gly
        675                 680                 685

Val Gln Glu Arg Arg Leu Lys Arg Ile Ile Ser His Pro Phe Phe Asn
    690                 695                 700

Asp Phe Thr Phe Asp Tyr Asp Ile Ala Leu Leu Glu Leu Glu Lys Pro
705                 710                 715                 720

Ala Glu Tyr Ser Ser Met Val Arg Pro Ile Cys Leu Pro Asp Ala Ser
                725                 730                 735

His Val Phe Pro Ala Gly Lys Ala Ile Trp Val Thr Gly Trp Gly His
            740                 745                 750

Thr Gln Tyr Gly Gly Thr Gly Ala Leu Ile Leu Gln Lys Gly Glu Ile
        755                 760                 765

Arg Val Ile Asn Gln Thr Thr Cys Glu Asn Leu Leu Pro Gln Gln Ile
    770                 775                 780

Thr Pro Arg Met Met Cys Val Gly Phe Leu Ser Gly Gly Val Asp Ser
785                 790                 795                 800

Cys Gln Gly Asp Ser Gly Gly Pro Leu Ser Ser Val Glu Ala Asp Gly
                805                 810                 815

Arg Ile Phe Gly Ala Gly Val Val Ser Trp Gly Asp Gly Cys Ala Gly
            820                 825                 830

Arg Asn Lys Pro Gly Val Tyr Thr Arg Leu Pro Leu Phe Arg Asp Trp
        835                 840                 845

Ile Lys Glu Asn Thr Gly Val
    850                 855
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<210> 28
<211> 20
<212> DNA
<213> Homo sapiens

<400> 28
ggcccgcgct ctgaaggtga 20

<210> 29
<211> 20
<212> DNA
<213> Homo sapiens

<400> 29
ttggcaagca ggaagcaggg 20

<210> 30
<211> 22
<212> DNA
<213> Homo sapiens

<400> 30
cctcctcttg gtcttgctgg gg 22

<210> 31
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